USDA GRADE STANDARDS FOR GREASE MOHAIR AND MOHAIR TOP

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
MARKETING BULLETIN NO. 62

USDA GRADE STANDARDS FOR GREASE MOHAIR AND MOHAIR TOP

CONTENTS

ISSUED MARCH 1977

INTRODUCTION

Mohair, the fiber of the Angora goat, has certain physical properties basic to its commercial value as a textile fiber. Among these is fiber fineness—a property of major consideration when determining mohair's market classification, value, and end use. Until recently this property was evaluated by visual estimations without the benefit of official guidelines. Today, there are Federal grade standards for grease mohair and mohair top based on fineness (average fiber diameter) and the variation of fiber diameters. These standards make possible a classification system covering the entire range of fiber fineness and provide a common basis for national and international mohair trading.

The official standards of the United States for grades of grease mohair and mohair top are issued under the authority of the Agricultural Marketing Act of 1946, as amended. This Act provides for the issuance of official United States grade standards to designate different levels of quality of agricultural products for the voluntary use of producers, buyers, and others. Except for the illustrations and slight editorial changes to simplify interpretation, the standards explained in this booklet are the same as the official standards contained in Title 7, Chapter 1, Part 32 of the Code of Federal Regulations.

APPLICATION OF THE STANDARDS

The U.S. Department of Agriculture (USDA) does not provide an official grading service for grease mohair or mohair top, but it has developed standards which can be used as guidelines in buying and selling mohair. These grade standards provide descriptions which act as a universally understood language for the trade. USDA standards for mohair:

- Aid growers in determining the grade of their clips.
- Offer growers guidelines for culling flocks and selecting replacement stock to attain grade uniformity in the flock.
- Provide a method for identifying differences in grease mohair and mohair top fineness through objective measurement.
- Provide a basis for determining prices and a universal market description for producers, warehousemen, handlers, top makers, manufacturers, and international traders.

DEVELOPMENT OF MOHAIR STANDARDS

In 1950, standards for grades of mohair were proposed. Seven grades, 40s, 36s, 32s, 28s, 24s, 20s, and 16s, set up in two series—spring shorn and fall shorn—were included in the proposal. Those standards, based on fiber diameter determined by visual examination, were not adopted.

In 1969, a cooperative in-depth study by USDA, the American Society for Testing and Materials (ASTM), the Mohair Council of America, and the mohair industry was undertaken to establish a basis for developing grease mohair grade standards. In that project, changes in average fiber diameter and fiber diameter variability due to processing grease mohair into mohair top were investigated. An equation was developed, based on this work, for estimating the average fiber diameter of grease mohair needed to produce mohair top of a given average fiber diameter. The equation is: Estimated average fiber diameter of grease mohair, in microns = −0.58 + 1.00 (average fiber diameter of mohair top, in microns). As a result of this study, grease mohair standards for 12 grades were proposed on January 26, 1971, and became effective August 1, 1971. The limits in average fiber diameter specifications included for each of the grease

mohair grades were set by applying this equation to the industry-recognized mohair top specifications issued by ASTM.

Specifications for grades of mohair top were originally issued in 1955 by ASTM. These specifications were based largely on USDA data. Further cooperative study by the mohair industry, USDA, and ASTM provided a basis for a revision of the ASTM specifications in 1969. On July 21, 1972, official U.S. standards for grades of mohair top were proposed and these became effective January 1, 1973.

MOHAIR STANDARDS

Measurement specifications for grease mohair and mohair top grades are shown in tables 1 and 2. However, mohair or mohair top which qualifies for a grade on the basis of average fiber diameter but fails to meet diameter uniformity requirements for that grade—standard deviation for grease mohair and fiber diameter dispersion requirements for mohair top—receives a dual grade designation. The first grade designation is based on the average fiber diameter. The second designation is that of the next coarser grade, and indicates that the standard deviation or fiber diameter dispersion does not meet the requirements for the grade corresponding to the average fiber diameter.

Table 1.—Specifications for the Official Grades of Grease Mohair

Grade	Fiber diameter		Approximate number of fiber measurements [1]
	Limits for average (microns)	Maximum standard deviation (microns)	
Finer than 40s	Under 23.01	7.2	1,000
40s	23.01-25.00	7.6	1,000
36s	25.01-27.00	8.0	1,200
32s	27.01-29.00	8.4	1,200
30s	29.01-31.00	8.8	1,400
28s	31.01-33.00	9.2	1,400
26s	33.01-35.00	9.6	1,600
24s	35.01-37.00	10.0	1,600
22s	37.01-39.00	10.5	1,800
20s	39.01-41.00	11.0	2,200
18s	41.01-43.00	11.5	2,200
Coarser than 18s.	43.01 and over		2,600

[1] The number of fibers to measure for each test shall be the number needed to attain confidence limits of the mean within ± 0.40 micron at a probability of 95 percent. Measurement of the approximate number of fibers for the grades listed above may serve as a guide to meet the required confidence limits. The numbers indicated are based on mohair matchings.

Table 2.—Specifications for the Official Grades of Mohair Top

Grade	Limits for average diameter (microns)	Fiber diameter dispersion (percentage[1])							Approximate number of fiber measurements[2]
		30 microns and under, minimum	40 microns and under, minimum	50 microns and under, minimum	30.1 microns and over, maximum	40.1 microns and over, maximum	50.1 microns and over maximum	60.1 microns and over, maximum	
Finer than 40s	Under 23.55	80			20	1			1,000
40s	23.55 to 25.54	74			26	4			1,000
36s	25.55 to 27.54	67			33	6			1,200
32s	27.55 to 29.54	57			43	8			1,200
30s	29.55 to 31.54	47			53	13			1,400
28s	31.55 to 33.54		80			20	3		1,400
26s	33.55 to 35.54		73			27	5		1,600
24s	35.55 to 37.54		64			36	8		1,600
22s	37.55 to 39.54		56			44	13		1,800
20s	39.55 to 41.54			82			18	6	2,200
18s	41.55 to 43.54			77			23	8	2,200
Coarser than 18s	Over 43.54								2,600

[1] The 2nd maximum percent shown for any grade is a part of, and not in addition to, the 1st maximum percent. In each grade, the minimum and the 1st maximum percent total 100 percent.

[2] The number of fibers to measure for each test shall be the number needed to attain confidence limits of the mean within ±0.40 micron at a probability of 95 percent. The approximate number of fibers for the grades listed above may serve as a guide to the number of measurements needed to meet the required confidence limits.

DEFINITION OF TERMS

Average Fiber Diameter. The sum of the individual fiber diameter measurements divided by the number of fibers measured.

Bulk Sample. A quantity of grease mohair selected for use in the preparation of standard samples.

Card Sliver. Mohair that has been scoured and carded and formed into a continuous, untwisted strand of loosely assembled fibers.

Core Sampling. Coring packages of mohair with special tools to obtain a representative sample according to the appropriate procedures described in the standards.

Fineness. Average fiber diameter.

Gilling. Blending and paralleling fibers by mechanical means.

Grade. A numerical designation of mohair fineness based on average fiber diameter and variation of fiber diameter. It does not include characteristics such as length, crimp, strength, elasticity, luster, hand, and color—usually referred to as "quality"—which affect the spinnability of mohair and the properties of the yarn and fabric. It does not reflect geographic origin, manner of preparation for market, nor the characteristics referred to as "type" which indicate that mohair is appropriate for a specific use.

Grease Mohair. Mohair as it is obtained from living Angora goats.

Hand Sampling. Drawing handfuls of mohair to obtain a sample according to the appropriate procedures described in the standards.

Lot. The entire quantity of grease mohair or mohair top considered or tested. A mohair top lot may not exceed 20,000 pounds (9,072 kilograms).

Matchings. Sortings made by grouping together parts of mohair fleeces that are closely similar in fineness, length, and other qualities with the neck, belly, britch, and stained portions removed, if necessary.

Micron. A unit of linear measurement equal to 1/1000 millimeter or 1/25400 inch.

Mohair Top. A continuous, untwisted strand of scoured mohair fibers from which the shorter fibers—noils—have been removed by combing.

Pulled Mohair. Mohair obtained from the pelts of slaughtered goats by pulling or similar means after

subjecting the pelt to sweating, a depilatory, or other treatment to loosen the mohair fibers from the skin.

Sample. A representative portion of a lot taken for grade determination.

Scoured Mohair. Mohair with the bulk of impurities removed by washing in warm water, soap, and alkali, or by an equivalent process.

Standards. The official standards of the United States for grades of grease mohair or the official standards of the United States for grades of mohair top.

Standard Samples. Physical samples representative of the standards.

Test. A determination, by measurement, of the average fiber diameter and standard deviation in fiber diameter of a sample of grease mohair, or the average fiber diameter and the fiber diameter dispersion of a sample of mohair top according to standard procedures.

Test Specimen. A representative portion of the sample obtained and prepared as described.

DETERMINING GRADE

The official U.S. standards for grades of grease mohair and mohair top are the basis for grade determination. Grade may be determined by inspection or by measurement. However, if the grade determined by inspection differs from that determined by measurement, the measurement grade prevails. Although the standards developed specifically for grease mohair are based primarily on tests of grease mohair matchings, they are also applicable to pulled or scoured mohair, and to card sliver.

Inspection

To grade by inspection, the fineness and variability in fineness of fibers of a sample representative of the lot or fleece are compared with the fibers of standard grease mohair or mohair top samples of the official grades. The grade assigned is that of the standard sample which most nearly matches the grease mohair or mohair top being graded.

Measurement

Mohair is graded by measurement by comparing the measured average fiber diameter and standard deviation of the fiber diameter (grease mohair) or fiber diameter dispersion (mohair top), with the official standard specifications for grades of grease mohair or mohair top, respectively. This determination is made according to the procedures for determining the average fiber

diameter, the standard deviation of fiber diameter, the fiber diameter dispersion, and the procedure for designating grade.

PROCEDURE

The average fiber diameter, standard deviation of fiber diameter, and fiber diameter dispersion are determined by: sectioning the fibers in a test specimen to a designated short length; mounting the sections on a slide; projecting the magnified image onto a wedge scale; and measuring the diameter of the required number of the fibers.

APPARATUS AND MATERIAL

The following apparatus and materials are needed:

Microprojector. The microprojector must give a precise magnification of at least 500X. This magnification can be obtained satisfactorily with a vertically installed microscope equipped with a 10-15X eyepiece, a 20-21X objective with an aperture of approximately 0.50 centimeter, a fixed body tube, a focusable stage responsive to a coarse and fine adjustment, a focusable substage with condenser and iris diaphragm, and a light source that will give a well-defined fiber image. The microscope must be installed so that the projection distance can be adjusted to produce the required 500X magnification.

Stage Micrometer. Calibrated glass slide used for accurate setting and control of the magnification.

Cross-Sectioning Device, Heavy Duty. An instrument approximately 2 inches (5 cm.) high, consisting essentially of a metal plate with a slot for holding a quantity of fibers, a key for compressing the fibers, and a tongue-propelling arrangement by which the fiber bundle may be extruded for sectioning.

Microscope Slides. 1″ by 3″ (25 × 75 mm.).

Cover Glasses. No. 1 thickness, ⅞″ by 2″ (22 × 50 mm.).

Mounting Medium. Colorless mineral oil with a refractive index between 1.53 and 1.43 of suitable viscosity.

Wedge Scales. Strips of heavy paper or Bristol board imprinted with a wedge for use at a magnification of 500X. The wedge is usually divided into 2.5 micron intervals (cells).

CALIBRATION

The microscope must be adjusted to give a magnification of 500X in the plane of the projected image. This is accomplished by placing a stage micrometer on the stage of the microprojector and adjusting the microscope so that an interval of 0.20 mm. on the stage micrometer will measure 100.0 mm. when sharply focused in the center of the image plane.

SAMPLING GREASE, PULLED, SCOURED, AND CARD SLIVER MOHAIR

The method of obtaining a sample or test specimen representative of the fineness of a lot of grease mohair, pulled mohair, scoured mohair or card sliver differs according to the manner in which the lot is stored and the equipment available for sampling. Lots may be sampled either by coring or by hand. The sampling procedures are as follows:

Core Sampling. Core sampling of packaged scoured, pulled, or grease mohair is advisable. Acceptable procedures and schedules for core sampling grease mohair are those described for raw wool in current ASTM Standards on Textile Materials, Designation D 1060, "Standard Method of Core Sampling of Raw Wool Packages for Determination of Percentage of Clean Wool Fiber Present."[1] If a representative portion of the scoured mohair core sample from the test for clean mohair fiber content is available, it may be used for fiber diameter measurements.

Hand Sampling an Individual Fleece. A sample shall consist of approximately 60 grams of mohair and be drawn at random from all parts of a fleece.

Hand Sampling Lots of Scoured, Pulled, and Grease Mohair. A sample shall consist of at least 6 pounds of mohair. If the mohair is packaged, the sample is drawn by taking a total of at least 50 randomly selected handfuls of mohair from not less than 10 percent of the packages randomly selected from the lot. If the mohair is in piles, the sample shall be drawn by taking handfuls from at least 50 locations throughout the pile.

Hand Sampling Card Sliver. Mohair card sliver is sampled, preferably during the carding operation, by drawing at random from the lot, ten 24-inch lengths of sliver.

---

[1] These ASTM Standards are published by the American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.

OBTAINING TEST SPECIMEN FROM CLEAN FIBER CORE TEST RESIDUE

The test specimen is obtained from the scoured mohair remaining after testing for clean fiber content by the following procedure. The sample is divided into 40 portions of approximately equal size. From each portion, a sufficient quantity of fibers is drawn at random to provide an aggregate test specimen of at least 40 grams. These fibers are mixed or blended to form the test specimen. For best blending results, test specimens obtained by 1¼-inch and larger coring tubes should be machine blended. Test specimens can be machine blended by carding the specimen three times, breaking the web and feeding at right angles after the first and second passes, or by gilling the specimens 15 times, breaking and combining the pieces of sliver to maintain a convenient length. Core samples drawn with smaller coring tubes should not be machine blended since loss of fiber may occur.

OBTAINING TEST SPECIMENS FROM OTHER SAMPLES (except card sliver)

Test specimens may be obtained by hand sampling or core sampling.

Hand Sampling. Samples are divided into 40 portions of approximately equal size. From each portion, a sufficient quantity of fiber to provide a test specimen of at least 40 grams is drawn at random. Test specimens of grease mohair and pulled mohair must be scoured or otherwise cleaned. Clean specimens, except those from samples of mohair with fibers less than 1¼ inches in length, must be further blended, preferably by machine, following the specified procedures.

Core Subsampling. The sample must be compressed in a suitable container. With a ½-inch coring tube with sharp tip, a sufficient number of cores must be extracted at random to provide a test specimen of at least 40 grams of scoured mohair. Test specimens of grease mohair or pulled mohair are to be scoured or otherwise cleaned.

NOTE: An example of a suitable container would be a box 12 inches by 10 inches by 6 inches deep, equipped with a floating top which has 16 equally spaced holes three-fourth of an inch in diameter. The mohair may be firmly compressed by applying pressure on the top. The top is held in place by two rods extending through holes in the side of the box and over the top. The coring tube is thrust through the holes in the top to sample the mohair.

OBTAINING TEST SPECIMENS FROM CARD SLIVER SAMPLES

Portions—approximately one-tenth the width of a sliver—are stripped from each of the ten 24-inch pieces of sliver. These pieces are combined to form a composite sliver which is the test specimen.

SAMPLING MOHAIR TOP

The lot is sampled by drawing from each 20,000 pounds (9,072 kilograms), or fraction thereof, four sections of sliver. Each section should be at least 1 yard (0.91 meter) long and taken from a different ball of mohair top, selected at random. Only one ball shall be taken from any one bale or carton. For broken mohair top (top not wound into balls), an equivalent length of sliver should be taken at random. Only one sliver shall be taken from any one can or package. The four slivers constitute the sample and each sliver is a test specimen.

TEST CONDITION

Test specimens shall be preconditioned to approximate equilibrium in an atmosphere of 5 to 25 percent relative humidity at a temperature less than 122° F. (50° C.). Then the test specimens shall be conditioned for at least 4 hours in the standard atmosphere for testing, 63 to 67 percent relative humidity at a temperature of 68° to 72° F. (19.0° to 22.1° C.).

PREPARATION OF SLIDES

Filling Cross-Section Device. Place a specimen in sliver form in the slot of the cross-section device, so that it will be cut at its approximate mid-length. Compact the sliver firmly with the compression key, then secure it with the set screw.

For specimens not in sliver form, draw small quantities of fibers from the bulk of the test specimen at random, packing the slot to the required level. Compact the specimen firmly with the compression key, then secure it with the set screw.

Preliminary Section. Cut off the gripped fibers at the upper and lower surfaces of the plate. The fiber bundle should be extruded to the extent of approximately 0.50 mm. to take up slack in the fibers and the propulsion mechanism. Moisten the projecting fibers with a few drops of mineral oil. Cut off this projecting fiber bundle with a razor blade flush with the upper surface of the fiber holder plate and the section discarded.

Final Section. The fiber bundle should again be extruded, approximately 0.25 mm., the equivalent of 250 microns. Moisten the fiber bundle with a few drops of mineral oil and blot the excess. Cut off the projecting fibers with a sharp razor blade flush with the holder plate. The fiber pieces should adhere to the razor blade.

Mounting the Fibers. Place a few drops of mineral oil on a clean glass slide. With a dissecting needle scrape the fiber pieces from the razor blade onto the slide. The fibers should be thoroughly dispersed in the oil with the dissecting needle and the slide completed with a cover glass. Use sufficient oil in the preparation of the slide to insure thorough distribution of the fibers, but avoid an excess. Practically no oil should be permitted to flow out or be squeezed out beyond the borders of the cover glass. If the number of fibers is too great to permit proper distribution on the slide, or if an excess of oil has been used, a portion of the mixture, after thorough dispersion of the fibers, may be wiped away with a piece of tissue or cloth. Slides must be measured the day they are prepared.

MEASUREMENT OF FIBERS

Procedure. Place the slide on the stage of the micro-projector, cover glass toward the objective. Make fiber diameter measurements at the approximate mid-length of the fibers. Fiber edges appear as fine lines without borders when they are uniformly in focus. It is unusual, however, for both edges of the fiber to be in focus at the same time. If both edges of the fiber are not uniformly in focus, make adjustments so that one edge of the fiber is in focus and the other shows as a bright line.

To record the measurement, mark the point where the wedge corresponds with the fiber image as determined by either the fine lines of both edges when they are uniformly in focus, or the fine line of one edge and the inner side of the bright line at the other edge when they are not uniformly in focus. Traverse the slide in planned courses so that fibers on all portions of the slide will be measured. Measure successive fibers whose mid-points come within the field (a circle 4 inches in diameter, centrally located in the projected area). Exclude from measurement fibers shorter than 200 microns, or longer than 300 microns, and those having distorted images.

The marks on the wedge scale indicating the diameter of fibers measured are counted and combined into cells for calculation. Occasionally a fiber diameter will be less or greater than the extreme limits of the wedge scale. When this occurs, project the image of the fiber onto the border of the wedge scale and draw lines on the scale at the edges of the fiber image. Measure the distance between the lines with a metric ruler to obtain the diameter of the fiber. When measuring fiber diameters in this manner, 1 mm. is equal to 2 microns.

NATURE OF TEST

One test consists of the measurement by two operators of the same test specimens. The measurement of both operators is combined for calculation of average fiber diameter and standard deviation (grease mohair) or fiber diameter dispersion (mohair top).

NUMBER OF FIBERS TO MEASURE

For each test, measure the number of fibers needed to attain confidence limits of the mean within ±0.40 micron at a probability of 95 percent. The approximate number of fiber measurements needed for each of the grades is listed in table 1 and table 2. However, the minimum number of fibers to be measured can be calculated by using the equation shown below:

$$n = \left(\frac{1.96\,\sigma}{0.40}\right)^2$$

In this equation:

n = minimum number of fibers to be measured, and
σ = standard deviation of fiber diameters.

For mohair top, each operator makes a slide from each test specimen, making a total of four slides per operator. The number of fibers to be measured per slide is determined by dividing the approximate number of fibers to be measured per test by 8 (the total number of slides prepared per test).

CALCULATION AND REPORT

Combine the measurements of both operators and make the following calculations by using the applicable formulae shown below:

The average diameter of fibers ($\bar{X}$)

$$\bar{X} = A + mE_1$$

The standard deviation (σ):

$$\sigma = m\sqrt{E_2 - E_1^2}$$

The confidence limits of mean at 95 percent probability level =

$$\bar{X} \pm \frac{1.96\sigma}{\sqrt{n}}$$

In the formulae stated above:

A = Midpoint of cell containing the smallest measurement
m = Cell interval
n = Total number of fiber measurements

$$E_1 = \frac{\Sigma fz}{n} \text{ and } E_2 = \frac{\Sigma fx^2}{n} \text{ where}$$

Σ = Summation
f = Observed frequency
X = Deviation in Cells from A

An example of the calculations is set forth below:

EXAMPLE OF CALCULATIONS AVERAGE FIBER DIAMETER, STANDARD DEVIATION AND CONFIDENCE LIMITS OF MEAN

Cell No.	Cell boundaries (microns)	A (microns)	Deviation in cells from A, x	Observed frequency, f	fx	fx^2	Cumulative frequency[1]	Cumulative percent[1]
5	10.0 to 12.5	11.25	0	1	0	0	1	0.10
6	12.5 to 15.0	—	1	15	15	15	16	1.60
7	15.0 to 17.5	—	2	66	132	264	82	8.20
8	17.5 to 20.0	—	3	141	423	1.269	223	22.30
9	20.0 to 22.5	—	4	165	660	2.640	388	38.80
10	22.5 to 25.0	—	5	176	880	4.400	564	56.40
11	25.0 to 27.5	—	6	138	828	4.968	702	70.20
12	27.5 to 30.0	—	7	99	693	4.851	801	80.10
13	30.0 to 32.5	—	8	79	632	5.056	880	88.00
14	32.5 to 35.0	—	9	55	495	4.455	935	93.50
15	35.0 to 37.5	—	10	35	350	3.500	970	97.00
16	37.5 to 40.0	—	11	9	99	1.089	979	97.90
17	40.0 to 42.5	—	12	8	96	1.152	987	98.70
18	42.5 to 45.0	—	13	6	78	1.014	993	99.30
19	45.0 to 47.5	—	14	4	56	784	997	99.70
20	47.5 to 50.0	—	15	0	0	0	997	99.70
21	50.0 to 52.5	—	16	3	48	768	1.000	100.00
	Total	Total		1,000	5.485	36.225		

Number of measurements (n) = 1,000
A (midpoint of cell containing smallest diameter measurement) = 11.25 microns
m (cell interval) = 2.5 microns

$$E_1 = \left(\frac{\Sigma fx}{n}\right) = \frac{5.485}{1.000} = 5.4850 \text{ and } E_2 \left(\frac{\Sigma fx^2}{n}\right) \frac{36.225}{1.000} = 36.2250$$

Average diameter, $\bar{X} = A + mE_1 = 11.25 + 2.5\ (5.4850) = 24.96$ microns.[1]
Standard deviation, $\sigma = m\sqrt{E_2 - E_1^2} = 2.5\sqrt{36.2250 \quad 30.0852} = 2.5(2.4779) = 6.19$ microns [2]

Confidence limits of mean at 95 percent probability level =

$$\bar{X} \pm \frac{1.96\sigma}{\sqrt{n}} = \bar{X} \pm \frac{12.1324}{31.6127} = 24.96 \pm 0.38 \text{ micron}^2$$

[1] These are needed only when determining grade of mohair top

[2] Round off the calculated values of average fiber diameter, standard deviation, and confidence limit of the mean to 2 decimal places as follows: If the figure in the 3rd decimal place is 4 or less, retain the figure in the 2nd decimal place unchanged, otherwise, increase the figure in the 2nd decimal place by 1.

GREASE MOHAIR GRADE DESIGNATION

Single Grade

If the measured average fiber diameter and standard deviation correspond to requirements in table 1 for a single grade, that grade is assigned to the sample. For example, if measured average fiber diameter = 28.50 microns and standard deviation = 8.1 microns, the grade designation is 32s.

Dual Grade

If the standard deviation exceeds the limits of the grade to which the average fiber diameter corresponds, the mohair is assigned a dual grade designation, the second designation being one grade coarser than the grade to which the average fiber diameter corresponds. For example, if measured average fiber diameter = 28.50 microns and standard deviation = 8.6 microns, the grade designation is 32s/30s.

Interpretation

Since all the portions of a lot of grease mohair may not be of the same grade, the grade determined represents only the average grade of the entire lot. It does not represent the grade of any component part of the lot.

MOHAIR TOP GRADE DESIGNATION

Single Grade

If the measured average fiber diameter and the fiber diameter dispersion correspond to a single grade in table 2, that should be the grade assigned. For example:

Average fiber diameter = 30.94 microns.
Fiber diameter dispersion:

30 microns and under	51 percent
30.1 microns and over	49 percent
40.1 microns and over	10 percent

Grade designation = 30s.

Dual Grade

If the fiber diameter dispersion does not meet the requirements for the grade to which the average fiber diameter corresponds, the mohair top is assigned a dual grade designation, the second designation being one grade coarser than the grade to which the average fiber diameter corresponds. For example:

Average fiber diameter = 30.94 microns.
Fiber diameter dispersion:
30 microns and under .....45 percent
30.1 microns and over .....55 percent
40.1 microns and over .....16 percent
Grade designation = 30s/28s.

HOW TO OBTAIN SAMPLES OF THE U.S. STANDARDS

Certified samples representing the U.S. standards for grease mohair or mohair top are available (individually or in sets) from USDA. A complete set of the grease mohair standard samples (fig. 1) represents the ten grades—40s, 36s, 32s, 30s, 28s, 26s, 24s, 22s, 20s, and 18s; a complete set of mohair top standard samples (fig. 2) represents the nine grades—40s, 36s, 32s, 30s, 28s, 26s, 24s, 22s, and 20s, each randomly selected from a bulk sample. The measured average diameter and the standard deviation of fiber diameter of the grease mohair bulk samples from which each standard sample was drawn correspond to the specifications for that grade in table 1.

The certification will be issued by USDA and will be signed by the Director of the Livestock Division, Agricultural Marketing Service (AMS), or by an official authorized by him.

Requests for standard samples of grease mohair or mohair top must be on an application form furnished or approved by AMS which is signed by the applicant. A certified check, draft, postal money order, or express money order, payable to the "Agricultural Marketing Service, USDA," in an amount to cover the cost of the samples requested must be included. The following agreement must appear on the form:

(1) No samples of the official grease mohair or mohair top standards will be used to represent such standards after cancellation.

(2) The standard samples will be subject to inspection by the Secretary or by any duly authorized officer or agent of USDA during usual business hours of the person having custody of the samples.

(3) The certificate covering any of the samples representative of the standards may be revoked and cancelled by the Director of the Livestock Division, AMS, if it is found upon such inspection that the samples are not representative of the official standards.

Cost of the Samples

Complete set of ten certified samples of grease mohair, grades 40s through 18s (fig. 1): $22 each delivered within the United States and $24 each when delivered outside the United States.

Figure 1. Complete set of samples representing the U.S. standards for grades of grease mohair. (negative no. BN 45100)

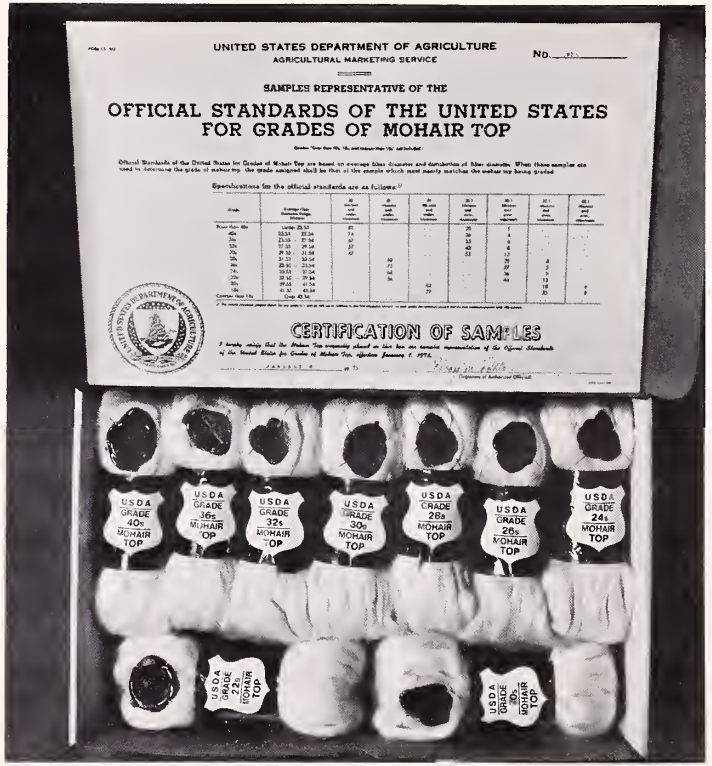

Figure 2. Complete set of samples representing the U.S. standards for grades of mohair top. (negative no. BN 45101)

Individual sample of grease mohair (fig. 3): $2.50 each delivered within the United States and $3.00 each delivered outside the United States.

Complete set of nine certified samples of mohair top, grade 40s through 20s (fig. 2): $27 each delivered within the United States and $30 each delivered outside the United States.

Individual sample of mohair top (fig. 3): $3 each delivered within the United States and $3.50 each delivered outside the United States.

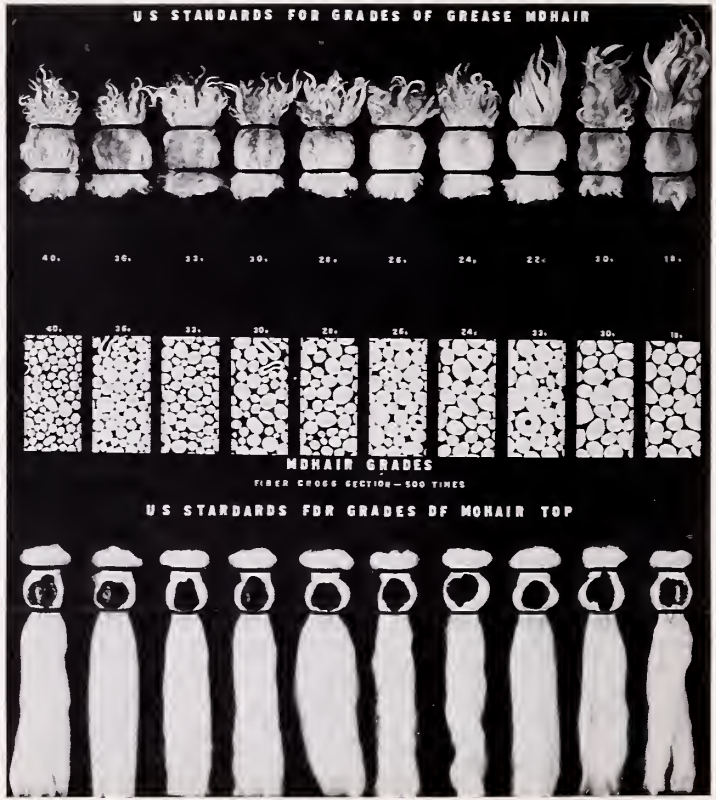

Figure 3. Samples of each of the U.S. grade standards for grease mohair (top); mohair fiber cross sections showing size variation in the different mohair grades (middle); samples of the U.S. grade standards for mohair top (bottom). (negative no. BN 45102)

☆ U.S. GOVERNMENT PRINTING OFFICE : 1977 O—227-965

This form may be used to order samples of grease mohair standards.

Form LS-260

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
LIVESTOCK DIVISION

APPLICATION FOR SAMPLES REPRESENTATIVE OF THE OFFICIAL GREASE MOHAIR STANDARDS

Livestock Division Wool and Mohair Laboratory
U.S. Department of Agriculture, AMS
Denver Federal Center, Building 81
Denver, Colorado 80225

(DATE)

Dear Sir:

Please send samples representative of the Official Standards of the United States for Grades of Grease Mohair, as follows:

COMPLETE SET— Grades 40s through 18s (10 samples each of approximately ¼ pound of mohair)

Price: $22 delivered to any destination *within* the United States
$24 delivered to any destination *outside* the United States

Number of complete sets desired: Price each: $ . . . . . $

INDIVIDUAL SAMPLES— (Individual samples of approximately ¼ pound of mohair, representing a standard grade.)

Price: $2.00 delivered to any destination *within* the United States
$2.50 delivered to any destination *outside* the United States

SAMPLE	QUANTITY	AMOUNT	SAMPLE	QUANTITY	AMOUNT
40s		$	26s		$
36s			24s		
32s			22s		
30s			20s		
28s			18s		

GRAND TOTAL

Enclosed is check, draft, or money order, payable to "Agricultural Marketing Service, USDA," in the amount shown above.

It is agreed that (1) no samples representative of the Official Standards of the United States for Grades of Mohair Top shall be considered or used as representing such standards after cancellation of the certificate as provided hereinafter; (2) the samples shall be subject to inspection by any duly authorized officer or agent of the U.S. Department of Agriculture during usual business hours of the person having custody of the samples; and (3) the certificate covering any of the samples representative of the standards may be revoked and canceled by the Director, Livestock Division if it is found upon inspection that the samples are not representative of the standards.

Sincerely yours,

SHIPPING ADDRESS INCLUDING ZIP CODE
(If different than shown at right)

SIGNATURE OF APPLICANT

ADDRESS - INCLUDING ZIP CODE

This form may be used to order samples of mohair top standards.

Form LS-262

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
LIVESTOCK DIVISION

APPLICATION FOR SAMPLES REPRESENTATIVE OF THE OFFICIAL MOHAIR TOP STANDARDS

Livestock Division Wool and Mohair Laboratory
U.S. Department of Agriculture, AMS
Denver Federal Center, Building 81
Denver, Colorado 80225

_____ (DATE)

Dear Sir:

Please send samples representative of the Official Standards of the United States for Grades of Mohair Top, as follows:

COMPLETE SET— Grades 40s through 20s (9 samples each of approximately 5 ounces of mohair)

Price: $27 delivered to any destination *within* the United States
$30 delivered to any destination *outside* the United States

Number of complete sets desired: _____ Price each: $ ..... $ _____

INDIVIDUAL SAMPLES— (Individual samples of approximately 5 ounces of mohair, representing a standard grade.)

Price: $3.00 delivered to any destination *within* the United States
$3.50 delivered to any destination *outside* the United States

SAMPLE	QUANTITY	AMOUNT	SAMPLE	QUANTITY	AMOUNT
40s		$	26s		$
36s			24s		
32s			22s		
30s			20s		
28s					

GRAND TOTAL _____

Enclosed is check, draft, or money order, payable to "Agricultural Marketing Service, USDA," in the amount shown above.

It is agreed that (1) no samples representative of the Official Standards of the United States for Grades of Mohair Top shall be considered or used as representing such standards after cancellation of the certificate as provided hereinafter; (2) the samples shall be subject to inspection by any duly authorized officer or agent of the U.S. Department of Agriculture during usual business hours of the person having custody of the samples; and (3) the certificate covering any of the samples representative of the standards may be revoked and canceled by the Director, Livestock Division if it is found upon inspection that the samples are not representative of the standards.

Sincerely yours,

_____
SHIPPING ADDRESS INCLUDING ZIP CODE
(If different than shown at right)

_____
SIGNATURE OF APPLICANT

_____
ADDRESS - INCLUDING ZIP CODE

For sale by the Superintendent of Documents, U.S. Government Printing Office
Washington, D.C. 20402

Price 55 cents; 25% discount allowed on orders of 100 or more to one address

Stock No. 001-000-03648-3

There is a minimum charge of $1.00 for each mail order